

## Production of drink cans from metal sheet, especially tin plate

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### Abstract of DE 19802953 (A1)

Tin plate drink cans are made by deep-drawing and ironing a circular blank to form an open cylinder with a domed top, punching a hole in the dome, fitting a resealable closure with a screw cap in the hole and closing the open end with a flat round metal base by flanging and folding to form a double fold. A process for the production of drink cans from sheet metal, especially tinplate, comprises: (a) making a circular blank, forming this by deep drawing and ironing to a cylindrical body open at one end, with a cylindrical wall and an outward-curved dome-shaped end (top); (b) punching out a hole in the center of the top; (c) fitting a resealable closure system with a screw cap into the hole; and (d) closing the open end of the can with a separate, essentially flat, round metal base by flanging and folding to form a double fold.

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The invention concerns a procedure for the production of a beverage box out of sheet metal, in particular tinplate.

Beverage doses are usually manufactured made of tinplate or aluminum. Nowadays mainly two-piece doses are used, which consist of a lower part and a cover. The lower part is einstückig and consists of an essentially cylindrical dose wall, with a dose bathing angeformt to it. By deep-drawing and Abstreckziehen on those in the following described way is manufactured. From a broad strip a circular washer, Ronde is called, cut out. From this Ronde first a cup is pulled by deep-drawing. This cup must between soil and cylindrical wall an essentially kegelstumpfförmigen transition, also bevel mentioned, exhibit, so that the actual dose soil in the finished condition exhibits a diameter, which is smaller than the diameter of the cylindrical dose wall. The production of this bevel prepares large problems with the deep-drawing, because secondary folds can occur. These secondary folds arise increasingly, if for the material saving and for the decrease of the weight of the box sheet metal with smaller initial thickness and at the same time higher firmness is used. Thin sheet metal thicknesses and higher strengtheningnesses lead to the increased secondary formation of wrinkles. After the deep-drawing of the cup by Abstreckziehen the cup height is increased around for instance the three-way, as the cylindrical wall of the cup in the length is stretched and accordingly reduced in the thickness. The high surface pressures in the Abstreckwerkzeugen (stamp and rings) would before destroy a lacquer finish applied on the sheet metal, so that one done without pre-coating and the interior and external finish take place only at the finished box. At the end of the Abstreckvorganges the dose soil is formed into its final form, as the Abstreckstempel dives into the dose soil and a soil tool (stencil), present outside of the dose soil. Here inward a cathedral curved to the dose inside is produced, which changes at its outside edge into a circular placing edge. On this placing edge then outside the finally formed bevel borders. By means of air pressure, which affects the inside of the dose soil, and/or by means of stripping fingers, the finished lower part is stripped by the Abstreckstempel. In order to be able to use from cost reasons a cover as possible as small in the diameter, for whose production fewer sheet metal one needs, the diameter of the upper, open end of the lower part is made smaller by Necken. Before the Necken the lower part on the exterior and on the inside a spraying lacquer finish receives a primer and printing on. After all painting processes a drying process is accomplished. Much with water-soluble lacquers results in each case solvents.

The use of beverage doses from tinplate in damp-tropical countries represents a problem for corrosion reasons at the dose soil because of scratching the lacquer.

In Japan there are also beverage doses, which have reciprocally a plastic coating from PET (polyethylene terephthalate). The plastic coating is applied on a chromed broad strip (ECCS) before the dose manufacturing, which takes place usually via laminating a prefabricated foil. The lower part is manufactured by deep-drawing and far pulling with straining, whereby a wall thinning is reached from approximately 30 to maximally 50%. The reciprocal plastic coating does not permit the Abstreckziehen, because the plastic coating, in particular on the dose exterior, would fail. Bright, chromed sheet metal is not suitable for the deep-drawing and the Abstreckziehen, since Fresserscheinungen at the tools arise. The experiences and applied measures made with chromed sheet metal cannot be transferred so easily to tinplate, because plastic on chromed sheet metal clings better than on tinplate.

In US 4.541.546 is a two-piece beverage box made of sheet metal, z. B. Tinplate or aluminum plate, described. With an execution form of this beverage box an upper section is manufactured by deep-drawing and Abstreckziehen, which exhibits a cylindrical dose wall and an upper, domförmig outward curved conclusion wall. In the center of this upper conclusion wall itself a sleeve, similarly as a short bottle neck, extending outward from the conclusion wall, is angeformt. The production of this sleeve requires however several tools and work procedures, whereby total production costs of this beverage box are substantially raised the price of. The sleeve is to be locked by a cap or a plug, whereby not more near is described, as these parts are to look and cooperate with the sleeve. In addition upper section is connected with the lower part by overlapping gluing in the range of the cylindrical dose wall with this well-known beverage box. For this purpose the lower part is reduced in the diameter by Necken, so that it is insertable in upper section. For this the lower edge of the upper section is warmed up, in order to increase the diameter, and the edge of the lower part cooled down, in order to make its diameters smaller. As corrosion protection on the inside of the upper section and the lower part a lacquer is applied by spraying, dipping or electrostatic coating after the deep-drawing and Abstreckziehen.

From the DE 31 05 538 A1 a procedure for the production of metal containers is well-known, with which a metal blank made of electric furnace steel sheet metal is deformed by deep-drawing first to a on one side open hollow body with a radial flange and a cylindrical side panel. To impair by a following Abstreckziehvorgang then the side panel of the hollow body with simultaneous retention of the wall thickness extended without the deep-drawing condition of the radial flange. In the closed end of the hollow body also an opening is punched out and flanged. Finally on the open end of the side wall a catch element is put on, whereby both a deformation of the flange and the edge of catch element takes place. With this well-known procedure however no coated sheet metal is used and also no sealing system is inserted into the punched out opening.

The RK 321,694 concerns a procedure for the production of steel sheet containers from a deep-drawable steel, with which a Ronde is formed first with practically continuous wall thickness by in or multi-level deep-drawing procedure to a cup. This is brought by following Abstreckziehen to its wall thickness under decrease on the desired finished height. This block letters contain however no reference to special PET coatings, which get over a deep-drawing and a following

▲ top Abstreckziehen without damage.

In the EP 0,168,070 A1 a procedure for the production of a container from steel sheet is revealed, with which into a Endwand an opening is in-punched and put into these a catch element.

From the DE 40 29 553 A1 a coated Metallblech is well-known for pulled doses, with which on a base metal biaxial a pulled polyester film under pressure and inserting of an adhesive layer is up-laminated. The production of a polyester film and the following thing Recken require however several jobs, before at all the film and/or. the foil on the broad strip to be up-laminated can.

Task of the invention is it to create a procedure particularly economical production of beverage doses from one with PET coated tinplate made possible.

This task is solved by a procedure with the characteristics of the requirement 1.

Favourable procedure measures are indicated in the Unteransprüchen.

With reference to the designs in the following the characteristics and advantages of the procedure are below more near described.

In Fig. 1 is partly in the profile, partly shown according to invention the new beverage box manufactured in the procedure in side view. It essentially consists of a dose body 1, a dose soil 2 and a again-lockable sealing system 3. The dose body 1 exhibits a cylindrical dose wall 4 and is at the one, upper end by with the dose wall 4 of a piece consisting, outward curved final part 5 locked, which forms the dose head. In the center of the domförmigen final part a central opening 6 is intended, which is formed by punching out. Into this opening the collet 7 is ago assigned from the inside of the dose body 1, which exhibits a flange 7a managing radially outward and at its neck part a screw thread 7b. On this screw thread the cylindrical fuseholder 8 is from the outside ago screwed on.

The cylindrical fuseholder 8 has a snap ring 8a, which is connected with the remaining cylindrical fuseholder by perforations, for the guarantee of the originality protection similarly as this with cover caps of Mineralwasserflaschen the case is. When first closing the cylindrical fuseholder 8 the snap ring behind one does not catch to the screw thread 7b belonging safeguard paragraph 7c at the collet, so that when late opening the cylindrical fuseholder the snap ring 8a is broken or torn off by the cylindrical fuseholder and one can recognize on the basis the torn off snap ring that the beverage box was already opened.

The lower, first open end of the dose body 1 exhibit a kegelstumpfförmigen section 9, which also introduction is called, for the decrease of the diameter D of the dose wall 4, and which is produced by so-called Necken. Z amounts to. B. the diameter D of the dose wall 4 66 mm, then is reduced by the kegelstumpfförmigen section 9 the opening diameter D1 to 57 mm or 52 mm. This takes place for the purpose that a dose soil 2 smaller in the diameter can be used. This dose soil 2 made of sheet metal is through connected to flanges and creases under production of a well-known double crease 10 with the dose body 1. Filling the box can take place either in such a way that first at its end open dose bodies 1 is filled with screwed on cylindrical fuseholder 8 standing on the head and up-folded then the dose soil the 2, or the dose soil before filling the beverage box can be up-folded and be filled the box then from the top by the collet through and be screwed on afterwards the cylindrical fuseholder 8. First has the advantage that a larger Füllgeschwindigkeit of the beverage box is attainable.

The cylindrical fuseholder 8 with snap ring 8a and the collet 7 become preferably from plastic, z. B. PE (polyester) or PET (polyethylene terephthalate) manufactured. If necessary also tinplate or aluminum could be used.

Preferably the collet 7 with its flange 7a is stuck together because of the high dose internal pressures with the domförmigen final part of 5 or sealed with use of warmth. The flange 7a and also the snap ring 8a guarantee the corrosion protection of the lip of the opening 6, if the dose body 1 exists made of tinplate. Since that a seals at the bright or painted sheet metal would be afflicted with technical uncertainties, the dose body 1 at its inside should exhibit a plastic coating, with which further down standing one deals still more in greater detail.

The new beverage box can be manufactured made of tinplate, aluminum plate and other Metallblechen. Preferably however tinplate is used. For the production of the dose body 1 of a broad strip a circular washer, Ronde is called, cut out. The plate thickness of the Ronde, also tin-lined cases thickness mentioned, can amount to between 0,16 to 0.30 mm, preferably about 0.20 mm. By deep-drawing the Ronde becomes a simple, in Fig. 2 represented cup 1' with a height H transformed. When using tinplate the deep-drawing in or in two stages takes place with a Ziehverhältnis beta from 1,6 to 2,4. In such a way formed cup 1' becomes then by Abstreckziehen in three to four stages in Fig. 1 represented dose body 1 transformed, whereby the original cup height H is increased approximately around the three-way and with the Abstreckziehen the dose wall 4 thinner opposite the cup wall develops. With the Abstreckziehen the wall thickness of the cup, which corresponds to the original tin-lined cases thickness, with a strain is reduced phi to a third. The shaping of the first even cup soil to a domförmigen final part and punching out the opening 6 take place at the end of the Abstreckziehens, as the dose body is stripped by means of air pressure of the Abstreckstempel and the air pressure is used for it to press the final part of the dose body into a forming tool (stencil) with domförmiger recess. In principle a later external cathedral production is also possible in connection with the cutting of the opening. Possibly only after cutting the edge of dose, if the external cathedral in the existing machines disturbs. In this case the soil remains flat with the Abstreckziehen. The dose body is made smaller afterwards at its open end by Necken in the diameter, so that in the diameter according to smaller dose soil can be also used. An optimal utilization of material is reached by the Abstreckziehen. The thickness of the final part, which corresponds for instance to the original in tin-lined cases thickness and which is thickness of the dose wall, which amounts to for instance a third of the original tin-lined cases thickness, optimally the requirements adapted. In the range of the open end of the dose body the wall thickness is thickened around approximately 60 µm opposite the remaining dose wall by the Necken.

If for the production of the dose body sheet metal without plastic coating is used, the dose body can after the Abstrecken and/or. Necken on the dose inside in the spraying procedure to be painted. More favourably it is however for the production of the dose body a sheet metal, in particular a tinplate to use which became to provide already before as broad strip with a plastic coating.

Because of the high pressures, which course-turned inside of the dose body arranged plastic coating with the Abstreckziehen between the stamp and that the stamp exist, only PET (polyethylene terephthalate) is applicable as coating plastic. In this case the Ronde from one is then punched out on one side with PET plastic-coated sheet metal and with the deep-drawing and Abstreckziehen the plastic-coated side the deep-drawing and/or. Abstreckziehstempeln course-turns.

After the Abstreckziehen then the entire inside of the dose body 1 is lined with a PET layer, like it in Fig. 1 is increased represented.

Appropriately a sheet metal is used, on which the PET layer was applied by direct extruding. By direct extruding of a liquid PET film on a broad strip heated up a particularly good adhesion of the PET layer can be achieved, what for the Abstreckziehen of substantial importance is.

In order to guarantee a high transforming ability of the PET, the PET layer should be brought appropriately in amorphous condition. This amorphous condition can be obtained by reheating of the coated broad strip on a temperature above the PET melting point and following fast deterrence in the Wasserbad. In order to keep the heating-up time as short as possible, the reheating can be caused by induction heating. The adhesion is improved in addition by the reheating. It is ensured by the amorphous PET layer that despite the high transforming demand no tears and pores in the PET layer arise.

In addition attempts showed that it is appropriate for the increased safety of the avoidance of pores and tears on production conditions to submit after the deep-drawing and before the Abstreckziehen the preformed dose body (cup) of a temperature treatment. This temperature treatment should take place at a temperature from 180 to 200 DEG C during one duration from 1 to 5 minutes. Since tinplate is a relatively inexpensive material for the production of doses, and PET the high demands with the Abstreckziehen resists, should for the execution of the procedure according to invention appropriately PET coated tinplate be used, with which the PET layer was applied by direct extruding.

For the dose soil 2 appropriately reciprocally with PET coated tinplate is used. PET is scratch-proof as a lacquer finish and forms for the dose soil outside at the placing edge 2a a durable corrosion protection. There is thus the beverage doses completely consisting of tinplate also applicable for subtropical countries.

It was found that during the coating of a broad strip a particularly good adhesion is reached if the broad strip on order behalf of the liquid Kunststofffilmes exhibits a temperature lying over the melting point of the respective plastic. The temperature of the broad strip should be appropriate for about 10 DEG over the plastic melting point. Since however the fusing temperatures of the different PET sorts lie between 230 and 280 DEG C, problems develop when the direct coating tinplate. The melting point of the tin may not be exceeded by 232 DEG C, since it comes otherwise to an iron tin alloy layer formation and in addition liquid tin with the feed roll would come with the extruding procedure into contact. Thereby the tin surface would be impaired and the tin could on the dose exterior the necessary lubricating action out with the Abstreckziehen not carry.

In order to achieve and on the other hand the tin layer of the tinplate not damage on the one hand the necessary high adhesion of the PET layer, therefore with the production of the plastic-coated tinplate it will proceed in such a way that between the tin surface and the PET layer an adhesion mediator from thermoplastic plastic is planned, whose fusing temperature <is/>= 210 DEG C.

The PET and the adhesion mediator are applied appropriately by Coextrusion on the tinplate volume heated up, which was heated up on a temperature lying between the fusing temperature of the adhesion mediator and the fusing temperature of the tin.

Thereby it can be achieved that at a temperature of the tinplate volume on order behalf of the two-layered Kunststofffilmes of approximately 220 DEG C a damage of the tin layer is avoided, because this temperature is under the fusing temperature of the tin of 232 DEG C. On the other hand however the temperature of the tinplate volume lies around at least 10 DEG over the fusing temperature of the adhesion mediator, so that the desired good adhesion of the adhesion mediator at the tin surface is reached. The adhesion mediator guarantees the desired good group between tinplate and the PET layer lying outside. The thickness of the PET layer should at the time of the execution of the procedure according to invention about 10 to 50 mu m, which amount to the adhesion mediator about 5 to 10 mu m. The used tinplate has a thickness from 0,16 to 0.30 mm. The tin edition amounts to 1.0 to 5.0 g/m<sup>2</sup> for each volume side, preferably 2.0 to 2.8 g/m<sup>2</sup>.

The production of a PET coated tinplate, which is particularly suitable for the production of a beverage box in the procedure according to invention, becomes following on the basis the Fig. 3 described. A tinplate volume 11 is moved in its longitudinal direction and heated up first by a heating mechanism 12. By means of a slot die 13 a two-layered plastic film 14 is extruded, which consists of a PET layer 14a and an adhesion mediator layer 14b of thermoplastic plastic. The adhesion mediator 14b exhibits a fusing temperature, which is not larger than 210 DEG C. The tinplate volume 11 was heated up before in the heating mechanism 12 on such a temperature that it exhibits lying temperature of approximately 220 DEG C within the order range 15 of the liquid Kunststofffilmes 14 over the melting point of the adhesion mediator and under the melting point of the tin. The Kunststofffilm 14 is then pressed in slightly to the tinplate volume 11, by being passed through a gap between a feed roll 18 and a role 17, which are called Laminatorrolle. The Laminatorrolle 17 resting against the Kunststofffilm 14 thereby on a temperature one holds, which is under the fusing temperature of the PET. Appropriately the Laminatorrolle 17 should be held by cooling on a temperature within the range between 20 to 80 DEG C. The cooling of the Laminatorrolle 17 takes place favourably via water, which by the Laminatorrolle 17 one through-leads. Furthermore a guide roller 19 is intended, by which the tinplate volume 11 with at the Laminatorrolle 17 lying close Kunststofffilm 14 under tension over a part of the extent of the Laminatorrolle 17 is led around. Pressing the liquid Kunststofffilmes 14 to the tinplate volume 11 should take place with on the width of the tinplate volume a referred Kraft from at least 60 N/mm. While the Kunststofffilm 14 rests against the Laminatorrolle 17, at least its PET layer must be transferred by cooling into the solid state, before the surface of the Laminatorrolle 17 from the Kunststofffilm 14 is loosened. The diameter of the Laminatorrolle and/or the Umschlingungswinkel, with which the tinplate volume as well as the Kunststofffilm 14 is held by the Laminatorrolle 17 in plant, it must be selected in such a way that at a volume speed of at least 50 m/min at least the layer of the PET with a cooling rate of at the most 400 W/m<sup>2</sup>. To cool down DEG C on a temperature, which is at least around 30 DEG C under the melting point of the PET, before the contact between Kunststofffilm and Laminatorrolle 17 is solved.

It proved as appropriate, if those is broader width of the slot die 13 than those of the tinplate volume. This leads to the fact that the Kunststofffilm manages 14 at each side of the tinplate volume around 20 to 30 mm.

The separation of the supernatant Kunststofffilmes takes place only after the cooling and hardening the plastic by means of the Besäumrollen 16, which are arranged at both sides of the coated tinplate volume.

As it was mentioned already further above it is important that the PET in an amorphous condition is present. For this purpose that PET coated tinplate volume by an induction heating mechanism 20 led, where it is brought on a temperature above the PET melting point. The excess of the tin melting point is not critical in this case, since because of the short

heating time the iron tin is very small alloy layer formation and the liquid tin does not come also with a role into contact. By direct introducing of the tinplate volume into a Wasserbad 21 the tinplate volume is finally deterred with high cooling rate on ambient temperature.



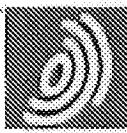
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1. Procedure for the production of a again lockable beverage box from tinplate, with the following process steps:  
Punch out a Ronde from a tinplate coated on one side with PET, on which the PET layer was applied as follows by direct extruding:  
a tinplate volume is moved and heated up in its longitudinal direction,  
by means of a slot die a film is applied thermoplastic plastic, consisting at least from a PET layer and an adhesion mediator layer, of melted, whose melting point amounts to maximally 210 DEG C, directly on the one side of the moved tinplate volume,  
the tinplate volume is heated up before on such a temperature that it exhibits lying temperature on order behalf of the liquid Kunststofffilmes over the melting point of the adhesion mediator and under the melting point of the tin,  
the Kunststofffilm is pressed in slightly to the tinplate volume, by being passed through a gap between two roles, by those the role, which is held Laminatorrolle, resting against the Kunststofffilm, under the fusing temperature of the PET,  
the tinplate volume is led around with by the Laminatorrolle lying close Kunststofffilm under tension over a part of the extent of the Laminatorrolle and by the Laminatorrolle over a time of contact or contact length in plant held, which is sufficient, over at a volume speed of at least 50 m/min at least the layer of the PET with a cooling rate of at the most 400 W/m< 2 > To cool down DEG C on a temperature, which is at least around 30 DEG C under the melting point of the PET,  
before the contact between Kunststofffilm and Laminatorrolle is solved,  
during a locking subsequent treatment the coated tinplate is heated up on a temperature above the melting point of the PET and the Kunststofffilm by direct introducing of the tinplate volume into a Wasserbad with high cooling rate on ambient temperature is deterred,  
It deforms this Ronde by deep-drawing and following Abstreckziehen, whereby the PET layer the deep-drawing and Abstreckziehstempeln is course-turned, to a on one side open, cylindrical dose body, with a cylindrical dose wall and a dose head curved domförmig outward,  
Punch out a central opening directly in the domförmigen final part,  
Begin a again lockable sealing system with cylindrical fuseholder into the central opening,  
Lock the other one, open end of the dose body with a separate, round dose soil out of sheet metal through for flanges and creases under production of a double crease.
2. Procedure according to requirement 1, by the fact characterized that the PET layer was brought in amorphous condition.
3. Procedure according to requirement 2, by the fact characterized that the amorphous condition is obtained by reheating of the coated broad strip on a temperature above the PET melting point and following fast deterrence in the Wasserbad.
4. Procedure after one of the preceding requirements, by the fact characterized that the dose body between the deep-drawing and the Abstreckziehen of a thermal treatment, partly preformed by deep-drawing, is submitted at a temperature from 180 to 200 DEG C.
5. Procedure according to requirement 4, by the fact characterized that the thermal treatment 1 to 5 minutes is accomplished.
6. Procedures according to requirement 1, marked by it that a plastic-coated tinplate is used, with which between the tin surface and the PET layer an adhesion mediator from a thermoplastic plastic it is intended, whose fusing temperature <is/>= 210 DEG C.
7. Procedure according to requirement 6, by the fact characterized that the PET and the adhesion mediator are applied by Coextrusion on the tinplate volume heated up, which was heated up on a temperature lying between the fusing temperature of the adhesion mediator and the fusing temperature of the tin.
8. Procedure after one of the preceding requirements, by the fact characterized that forming the dose head at the end of the Abstreckziehens takes place, as the dose body is stripped by means of air pressure of the Abstreckstempel and the air pressure is used to press the final part of the dose body into a stencil with domförmiger recess.
9. Procedure after one of the preceding requirements, by the fact characterized that the dose body at its open end is made smaller by Necken in the diameter, before the dose soil, which exhibits a smaller diameter than the cylindrical dose wall, is up-folded.
10. Procedure after one of the preceding requirements, by the fact characterized that from a cylindrical fuseholder and a one with a flange provided collet existing sealing system is used on one side that the collet is put ago by the inside of the dose body by the central opening of the domförmigen final part, until its flange at the inside of the final part lies close and that onto the part of the collet provided outstanding from the final part with a screw thread the cylindrical fuseholder is screwed.
11. Procedure according to requirement 10, by the fact characterized that a sealing system is used, whose cylindrical fuseholder and collet consist of plastic.
12. Procedure according to requirement 10 or 11, by the fact characterized that the collet is bonded or in-sealed into the final part.

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13. Procedure after one of the preceding requirements, by the fact characterized that a dose soil made of sheet metal is used, which is coated with plastic reciprocally.
14. Procedure according to requirement 13, by the fact characterized that for the dose soil a tinplate reciprocally coated with PET is used.
15. Procedure according to requirement 1, by the fact characterized that the tinplate volume is heated up on such a temperature that it exhibits a temperature lying around at least 10 DEG C over the melting point of the adhesion mediator on order behalf of the Kunststofffilmes.
16. Procedure after one of the requirements 1 to 15, by the fact characterized that pressing the liquid Kunststofffilmes in slightly to the tinplate volume by means of the Laminatorrolle with Kraft of at least 60 N/mm, related to which width of the tinplate volume takes place.
17. Procedure after one of the requirements 1 to 16, by it characterized that the cooling of the Laminatorrolle takes place via water, which by the role is through-led.
18. Procedure according to requirement 17, by the fact characterized that the Laminatorrolle is held by cooling on a temperature within the range of 20 to 80 DEG C.
19. Procedure according to requirement 1, by the fact characterized that the rapid cooling during the subsequent treatment with a cooling rate of at least 1000 W/m<sub>2</sub> DEG C on a temperature under 20 DEG C takes place.



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<Desc/Clms PAGE NUMBER 1>

Turned beverage box with soil break-through the invention is concerned with a beverage box, which is to be described as a thin-walled box. These beverage doses are usually manufactured while stationary the technology made of Metallblech (material sheet) in a wall thickness by under 0.24 mm. Preferentially if beverage doses, thus thin-walled doses for the admission of a beverage, are prefers a karbonisierten beverage, with which the box is additionally stabilized due to the internal pressure after their locking, so that it is not only insignificantly ductile against mechanical deformations (arranges from the hand of the user) or from the outside.

From the state of the art, see. The USA 2001/2532 (American disclosure) or US-B 6, 230, 913, are straws as drinking assistance well-known, that are inserted into a container, as, a flexibly ductile bottle consisting of plastic to be described can. The assigned straw is broken, exhibits at the bend faltenförmigen bellows and is gotten jammed for filling by the drinking opening first edge-laterally the filling opening mechanically, see. there Abstract as well as page 2, section 32. After filling the pre-loading of the drinking assistance can be solved by mechanical deforming of the bottle, whereby the Trinkhalm knocks against at the internal side of the cap catch. The drinking opening and the filler opening are the same openings, and also the straw is inserted by this drinking opening the inside the container.

Contrary to the state of the art the invention the task is the basis to improve conventional beverage doses regarding several well-known and disadvantages of many years. Under these disadvantages or in combination those, which are called in the following, are individual.

- The well-known beverage doses are not again lockable.
- Leaves itself when consuming the last remainder of beverage contents from that Beverage doses well do not drink, which the specialist with the so-called "Head bake syndrome" designates.
- A complete emptying of remainder leaves itself (on avoidance Head baking Syndrome) do not reach, even with employment of this drinking way remains smaller Remainder still in the beverage box.
- A lip contact with the cover mirror in the surrounding field of the drinking opening, necessary for drinking, is in the eyes of the user a weak point of Beverage doses.

<Desc/Clms PAGE NUMBER 2>

These four problem areas were turned on in the past already different way, especially drinking assistance are in the form of straws well-known, which come out when opening from the opening, see. the above writings as well as accessible the use of a straw in a beverage bottle under the mark "Pop Straw", become by use. With this organization while stationary the technology becomes drinking from the bottle more pleasantly, and she is again lockable. The conversion or the transmission of the relockability on beverage doses leads while stationary the technology regularly to complicated new cover geometry, which makes it necessary, production lines with filling umzustalten, which is unwanted. Therefore the problems described above are to be solved, in particular in combination to make without up-succumbing to the rackings of the doses, in its Abfüllnien change from the invention.

For solution requirement 5 as well as a procedure is suggested. Used components are the subject of the requirements 1 and 8.

The doses according to invention do not lose their pile ability. The filling happens according to kind of a normal dose filling, so that production lines do not have to be changed over.

A safety device against positive pressure can be realized when first opening by an interruption of the thread with an axial groove, whereby a way shooting of the cover can be avoided when opening.

The again-lockable opening lies in a final section, which is domförmig inward curved in particular (requirement 1), in particular essentially in its center. This section corresponds to a drawn in soil section with usual beverage doses, so that by a rebellion ring will surround the cover cap can, which intervenes in an accordingly eingehalste organization of an above final section of a stacked box, in order to secure the pile ability. The eingehalste final section corresponds to that section, which contains an opening system, with usual beverage doses here however without opening system is trained.

The opening system according to invention is again lockable and is in a soil section. The usual beverage box is used inverted with the user, but does not invert with the filling assigned.

<Desc/Clms PAGE NUMBER 3>

The relockability can be realized by a cap, which does not impair the pile ability of the box (requirements 17 to 19).

A drinking assistance can be taken up in the thin-walled box as containers as well as contents. It moves itself after opening from containers out, whereby the opening, made of which the drinking assistance out-steps when opening, is not

• ▲ top that opening, by which the thin-walled box was filled, on the contrary takes place driving out the drinking assistance at that final section of the thin-walled box, which that filling faces.

Removing the stem (when drinking assistance) due to that the stem added mechanical stress effected automatically, during opening, and must be considered by the user not additionally. The opening planned for the out moving of the drinking assistance is again lockable (requirement 10).

The relocking with the cap ensures for the fact that the drinking assistance is pressed again the inside the container, and that can again be developed pre-loading. Renewed opening of the again-lockable container ensures for it that the drinking assistance shows up again due to the stored (mechanical) energy, independently of it, soft amount of filling in the box still present is.

Thus the invention has substantial advantages in relation to such solutions of the state of the art, with which the out moving of a drinking assistance is caused only by lift forces of the liquid.

Locking with the catch mechanism happens in such a way the fact that the catch mechanism on use-begin touched down, by a rotating motion locked and thereby is again-locked which used similar final section in one sole geometry of a usual beverage box is closely arranged (requirement 2.11, 12).

In can the drinking assistance began, preferentially as a Trinkhalm (requirement 13), be laterally led, which radial guidance does not have to be a direct contact (requirement 16), but to guarantee can that the drinking assistance out-steps reliably when opening from the drinking opening opened then by opening essentially axially arranged. Air can move by when drinking between stem and guidance.

<Desc/Clms PAGE NUMBER 4>

The guidance for the drinking assistance is arranged, in particular close of this opening in axial alignment or even in this opening (requirement 11), in order to permit those spatially/geometrical allocation of the drinking assistance to the opened opening section and to favour a filling of the beverage box lying temporally in former times at the same time.

The filling takes place according to kind of a dose filling in a Abfüllinie, whereby the first larger opening (the open fuselage end section) serves for filling in the beverage, this opening with a cover at an edge of crease, provided without sealing system, is then locked (requirement 1).

The user can take the beverage over an imported drinking assistance at the opposite end by use of the resealing system described before (requirement 6.7).

The guidance is in such a way arranged that it co-operates together with a straight-line section of the drinking assistance well and friction-poor. An intermediate notice at the drinking assistance can prevent that the mechanical pre-loading removes the drinking assistance too far from the inside of the thin-walled box.

The pre-loading can be intended as an internal internal voltage of the drinking assistance (requirement 14). This can be achieved by a at least in sections spiral forming out inside the box or a bend, diffraction or a balgenförmigen section.

With the manufacturing and with filling the drinking assistance must not the consumption opening be passed through, but can by the larger opening of on one side open trunk be first introduced, with locked opposite end with the again-lockable withdrawal opening. Filling the box takes place with the same opening, with the following locking of this opening over a crease section. In such a way locked larger opening cannot be opened by hand no more, on the contrary the facing again lockable opening is intended for the user. This opening is locked during filling, so that the drinking assistance at this opening is closed during filling for a withdrawal (requirement 7).

<Desc/Clms PAGE NUMBER 5>

Fixing the drinking assistance with that opening, which is used for filling, can take place by means of a special form of the plant of the this-lateral end of the drinking assistance. Already here the mechanical pre-loading is brought into the drinking assistance.

The drinking assistance is already set with the filling under tension and can keep this tension again, if the user locks the again-lockable drinking opening.

With proceeding for filling and locking the function of the filler opening recognizable as open fuselage end section and their locking with a beverage dose cover are. The container not locked yet is the subject of the requirement 1 as thin-walled box, for use in an intended procedure, but oriented at the manufacturer of the box according to requirement 1, that is supplied to the Abfüller for use.

Thin-walled containers can be provided with a drinking assistance standing under pre-loading already that this jumps out not from the container and is taken up by the container completely, whereby the drinking assistance close of the open end is supported, in order not to obstruct a filling. The drinking assistance can be introduced also after opening of the user.

At the not open end a again-lockable catch arranged, whose guidance is suitable to lead the drinking assistance with later opening by the user here, is to be steered for example removing and, permitted it, the opened opening also again to lock and the pre-loading again in the drinking assistance to develop. Also introduction is laterally led. Oriented itself at the user, which has (filled) the box according to requirement 5 before itself and it can use 6 in in the requirement the way described. In addition, for the first time a stem to introduce knows.

The opening originally used for filling is locked for this condition of the beverage box (requirement 7), offered for the Abfüller however the possibility of using a dose filling instead of a bottle filling. It does not have to change its Abfüllinien over with the employment of the container bodies according to invention according to requirement 1.

<Desc/Clms PAGE NUMBER 6>

Remark examples describe and supplement the invention.

Figure 1 is a cross section by a locked beverage box 1 with one in The internal beverage box intended drinking assistance 17.

Figure 1a is a cutout enlargement first and second

Final section of two beverage doses, which are stacked and take up between itself the catch 2 with cap 3.

Figure 1 b is an alternative organization drinking of the 17a' einer drinking assistance to Use in figure 1.

Figure 2 is a thin-walled beverage box 1 in an intermediate condition with that Manufacturing, with a soil opening 11 within the domförmigen range 1a".

Figure 3a illustrates an opening of a locked beverage box with a drinking assistance lying inside, by removing the cover cap in Direction v.

Figure 3b is a first organization of a drinking assistance 17 when inserting into on one side open trunk 1K, 1 A.

Figure 4 is a second organization of a drinking assistance 17 after using in a on one side open trunk of a thin-walled beverage box and fixing close of the open end of 10.

The described thin-walled container is described in the example as a beverage box, which is easily recognizable in all figures. Other containers employment can find in addition. These containers described with an intermediate sector 1K, which are essentially cylindrical with a beverage box, and a final section 1 b, which is locked with a beverage box with a cap 1 b' over an edge of crease F. A substantial section of the cover is not the cover mirror 1b', an opening system to open by hand exhibits.

Oppositely the intermediate sector is locked, without an edge of crease. In this final section 1a, which is provided with a beverage box with a curvature 1a providing to the interior I", essentially centrically a again-lockable catch 2 is intended, which exhibits a cover cap 3.

The again-closable catch, respectively its cover cap 3 is from one

<Desc/Clms PAGE NUMBER 7>

Rebellion ring 1 a' umgeben, whereby between rebellion ring 1a' und domförmigem section 1a " a transient area 1a " is arranged ', which is trained in a reproducing procedure or transforming more steeply or more strongly.

The entire (filled and locked) beverage box 1 possesses in this rewriting a trunk 1a, 1K, which is reciprocally locked, but at a sealing system 2 can be opened, whereby this is so arranged in the range of the soil of a usual beverage box that stack 1 over the rebellion ring a' away is still possible, which protrudes away from the inside in axial direction. It intervenes when stacking in the edge of crease F of an underlying box, and/or. the edge of crease seizes radially over the rebellion ring over here, whereby the doses are inverted stacked in relation to usual doses, with its drinking opening upward, which is arranged however in a soil range of a usual beverage box. The cover area with a sealing system for breaking, used with a usual beverage box, forms a soil, which cannot by hand be opened with the packing described here and which is stacked over the again-lockable catch described before.

From the description of the stacking result constructional organizations for radial dimensions and axial heights, which are to be described on the basis the figure 1a later.

For orientation the figure serves 1, which must be presented also in the reverse condition, if a finished filled box with a drinking assistance 17 lying in it is described in the following.

The sealing system 2 is usually for a filling downward arranged planned, as on the basis the figure 3b is described later, for the user presents themselves the beverage box after figure 1 in that condition, how it is drawn in figure 3a. An alternative opening system for the use of the figure 1 or the inverted condition of the figure 3a shows the figure 1b.

Before the one which can be filled the trunk after figure 3b or in an alternative organization of the drinking assistance 17 in figure 4 be filled and locked can, it must be manufactured, which with a beverage dose trunk after figure 2 more near to be described is, which the again-lockable catch 2 yet does not possess, instead of whose a soil opening exhibits 11 and already to that extent from a " conventional " beverage box differs, on in the rest of process the shape of the trunk after Figure 2 however purchase to be taken can.

<Desc/Clms PAGE NUMBER 8>

The production of the organizations used for the figure 1 happens in the course of the production of a abgestreckten dose trunk, which receives a soil opening 11 after the Abstrecken, which is essentially centrically arranged. The axie 100 is here drawn in, in order to make possible after for orientation axially and radially.

For the description the cylindrical coordinates are to be used.

The beverage box exhibits the shape in a Rohzustand before the completion of the trunk fillable of the Abfüller after figure 2, with the Bodenring 1a' als rebellion ring and to the internal I curved the soil 1a", within the rebellion ring 1a". In this curved section the soil opening 11 is intended, which becomes in the course of the manufacturing and use a drinking opening, if the box can be turned after filling and locking the opposite section 1 b. The intermediate sector 1K of the trunk 1 is essentially cylindrical and with a thin metal wall provided, which is strong under 0.24 mm.

1 b a eingehalster section 1K is " at the opposite end, which changes into an edge of crease 1k\* (flange or trunk hook). The opening 10 of this end exhibits an internal diameter d10, which lies within the edge of crease 1k\* and is larger than the opposite opening 11.

Into the training of figure 2 by the final section 1 A is inserted ago a again-lockable sealing system 2, which is to be described on the basis the figure 1a more near.

If the sealing system is inserted, it is still locked and can a drinking assistance 17 inserted ago from the larger opening side 10 in a final section accept and at a withdrawal at the side 1a close.

The drinking assistance with introduction, like it on the basis the figures 3b and 4 is recognizable, under a pre-loading set, which lies in a plant place justified, outgoing from that those drinking assistance a curvature, a bend or a spiral partial coil exhibits. The landing place lies close of the future edge of crease F, exhibits of it however a distance g or h. After the introduction of the drinking assistance 17 this on the basis of the plant place close of the open end exhibits an angle A, which is away oriented by the wall 1K and is larger zero. It is preferential > 30, in order to support the this-lateral end of 17b or 17b' der drinking assistance 17 in such a way in the interior of the box at the wall that the drinking assistance does not slip despite the formed mechanical pre-loading or on the filling side 10 axially out-stood.

&lt;Desc/Clms PAGE NUMBER 9&gt;

In in such a way outlined form after figure the drinking assistance 17 under an internal pre-loading is arranged 3b and 4 in the interior. Close one locked of the opening of the first is led it, which by use-begin 4, which are under the cover cap 3, one reaches. The cover cap 3 covers the again-lockable catch, in order to squeeze when opening the opening, which corresponds to that opening 11 from figure 2 from the situation, the drinking assistance of the pre-loading out floated at least a section of their length far of the opening.

Squeezing out happens essentially axially arranged, what by the guidance 4c can be guaranteed. The guidance is arranged in such a way with the fact that it produces little friction, but sufficiently axial guidance characteristic ensures and with the user in the condition of drinking (in the sense of sucking drinking) in accordance with figure 3a and with removed cover cap 3 air into the internal 1 of the beverage box to flow at the same time leaves, between the exterior of the drinking assistance 17 and the interior edge 4c as example of a guidance used 4.

Other floor parts 4 or stylings at the domförmigen section 1a" are just as possible, for z. B. a purely metallic guidance during appropriate execution and with appropriate training of the soil section, a metallic use-begin, or late the one which can be described plastic-use-begin to 4, which exhibits the guidance 4c mentioned before as extensive edge close of the exterior surface of the drinking assistance 17 in the front section 17a, if the catch 3 is still locked. Opening of the catch 3, for example by release of a bayonet-like catch technology or by release of a thread interference, leaves the drinking assistance with the front section 17a, which is called also first end, from the opening out urge, by contact, lead not compelling but by delimitation of the maximum evasive action of at least in sections arranged guidance 4c at the internal final range of using ILS 4, which can be arranged also other, shown more concretely in figure 1a, with similarly arranged guidance.

The guidance 4c, the sealing system 2 and the stacking should be still described on the basis the figure 1a, how is to be inferred from the preceding remarks.

In this connection the figure concerned is only one cutout from two dose bodies, which are shown in the stacking range. As far as elements were described before, they can be transferred with their reference symbols to this figure 1a. That concerns on the one hand the drinking assistance 17 with her first final section shown here 17a as drinking section. That concerns likewise the axle 100 as guideline assistance, and the lower

&lt;Desc/Clms PAGE NUMBER 10&gt;

End to 1b'der upper box and the upper end of 1a of the lower box, related to the pile direction and the situation of the figure 1a.

With the stacking it is evident that the crease range F of the upper box seizes radially and axially over the rebellion ring 1a'der lower box with its upper end, which the first end or the first final section is called. The sealing system 2, consisting of removable cap 3 is and use-begins to 4 underneath the cover mirror of 1 b'des lower end of 1 b of the upper box intended.

It becomes here a distance between the upper end of the catch 3 and the lower surface of the cover mirror 1b'gewahrt, which is named " C ". This distance C sits down together from two masses D and e. " e " is the measure of the cover mirror 1b'bis zu of the level, which is formed by the axially highest place of the rebellion ring 1 more a'der lower box.

This rebellion ring does not serve here any longer than such a ring for placing the box, but it lies upward arranged and serves for to the radial guidance and supporting of the stacked lower end of the upper box.

The distance D further which can be supplemented is that the described level of the ring 1 A of the upper end of the catch 3. Both distances summed up result in the distance C, which avoids an affecting of the upper end of the cap 3 and so that radially outside of the rebellion ring 1 a'und axially below of it ensures a safe guidance and supporting of the crease catches F.

A further measure is to be supplemented. It is the measure of A, which reaches from the lower surface of the mirror 1 b' (panel) up to the place, of which the crease catch F radially outside of and axially below the rebellion ring 1a'an of the lower box in the range its (of drawn in) upper final section 1a fits.

The mirror 1 b'ist in the represented adjustment a soil mirror, which is covered by a balance groove N close of the crease range F.

The catch 2 with the cap 3 is to be described more near, what is clearly evident at the sectional drawing of figure 1 A. A thread 3a is intended, which used the cap and again-lockably connects. A sealing ring 3b is effective in the locked condition and seals the internal pressure in the interior 1 of the lower box in relation to the cylindrical section

&lt;Desc/Clms PAGE NUMBER 11&gt;

using ILS 4 off, whereby a compression stress used 4 between cover cap 3 and forehead of the cylindrical section 4b is developed. In addition against the inside of the catch 3 the drinking 17a of the stem 17 rests, compelled by a developed thrust force or a mechanical pre-loading, which is produced in a tension section 17d of this stem.

The guidance 4c is as internal edge of a more deeply lying internal final section of the cylindrical section 4b used 4 intended. This part exhibits radially outside and axially easily above the guidance 4c a ring section 4d, which is fit in into the opening, which was designated on the basis the figure 2 with 11. Here a connection is intended, whereby a collar, which is axially outside out curved after, prefers from which curved cathedral section 11 A" of the upper end of 11 A of the box is formed. The radial collar 4d (ring section) of using ILS 4 is thus provided firmly, against pressure closely with the boundary region of the opening 11, for example by sticking or other one mechanical connections.

From it results the distance f, which reaches from the described top side of the closed catch 3 up to this collar, which corresponds essentially to the axially deepest point of the remaining soil section 1 A".

The radially internal end of 4c forms the guidance for the drinking 17a and also the afterwards linear following sections of the Trinkhalms, which steps out by the tension section 17d-geführt of the internal guidance 4c, not compellingly through contact with opening the catch 3 from the box.

The reproduced section 1a" in figure 1a is more steeply than that section of a usual dose trunk also in-curved soil section 1a". That is done via reproducing.

To a forms at the eingehalsten section 1K" at the lower end the upper box corresponds a necks upper end of a usual beverage box, with which the cap exhibits 1b'eln opening system in breaking or imprinting.

Accordingly also the upper end of the lower box drew in, which is symbolized by the section 1k'der cylinder wall 1K. These collections are co-ordinated, whereby the described interference effect of the edge of crease F develops for upper ring section radially outside of and axially below the 1a' (the " rebellion ring ").

<Desc/Clms PAGE NUMBER 12>

The figuratively represented distance between the guidance 4c and the exterior of the stem 17 serves the wake of air when taking a beverage in the opened condition (see, in addition the figure 3a). An alternative organization Halmendes 17a is symbolized in figure 1b, with in the rest of similar organization of the guidance of using ILS, as it was described before at figure 1 A. The stem has here a bulge range 18, which is intended at the upper end and is with to be avoided that it can be pressed down by a Hereinschieben over the internal tractor margin 4c. It forms thereby a barrier of the stem, against a loss of the guidance.

The cylindrical fuseholder 3 is just as in an educated manner as that of figure 1 A, only the essentially cylindrically rotating collar 1a\* of the boundary region of the opening 11 designated of figure 2 is here, which collar section 1a\* changes 1 A" of the domförmigen soil of the upper end of 1a of the box 1 over a curved soil section into the more weakly bent curvature.

With the internal guidance 4c also the internal opening 4a is described, by those the stem with its drinking 17a, which can be trained essentially linear in accordance with 17e after figure 1, through is enough. This opening 4a has a smaller measure than the manufacturing opening 11, into which inserted 4 sealing one brings in.

The opening movement after figure 3a when opening through tricks the operatable plug 3 of the catch 2 is symbolized by removing the linear (axial) section 17e of the stem 17, which is energized due to a curved section 17d internal. Its plant place is intended in the angle A (in first approximation) and in the distance g, but close of the lower end of 1b' (the catch mirror) of the final section 1b of the locked box. This box (from cylinder wall 1K and upper section 1 A as well as locked "lower" section 1 b) is filled with a beverage, which can be taken after removing the linear section 17e by the channel opening 17c. The distance b essentially corresponds to the distance b1 von Figur 1.

The out-moving of the stem is steered from the internal pre-loading, as will see 3a at the figure can. The internal pre-loading provides for at least partial easing the pre-loading of causative lower section of the drinking assistance, whose outermost end at the edge of the box is supported, in the angle A, described before. The release of the pre-loading must be not complete, but leads up to a notice 19, that in one approximately degree line towards section 17e

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the drinking assistance 17 (the stem) is arranged. The stopper 19 has a distance b from the end of 17a of the straight section 17e of the drinking assistance 17, so that the width b1 can be limited, around whom the drinking assistance 17 by the mechanical pre-loading from the opening is squeezed out. The measure of b is slightly more largely, than the measure of b1, oriented at the height of using ILS 4.

Bringing in the stem 17 which can be set under tension is to be described in figure 3b. Here the box is shown in the reverse condition, as it is to be regarded 3a in the finished condition in figure. It is to be considered that stem inserted by the manufacturer of a beverage box with 17 exactly those objects are delivered, which are evident in figure 3b and figure 4. They are suitable for the dose filling, which is not bottle filling. Thus such a filling, with which the beverage G is out filled in by the larger opening 10 (bspw. with connecting piece S) and this opening afterwards with a cover with cover mirror 1 b'und edge of crease 1k\* is locked, over a crease F, as described before. Then the box can be turned, with still locked cover cap 3.

The alternative organization of the drinking assistance 17 is to be recognized by figure 4, which exhibits a stronger curvature in the lower final section of the stem in its tension section. This section 17b', from the plant place in the distance of the h of the upper edge of crease 1k\* outgoing in an angle extended, is convenient in substantial portions of its axial extending close of the drawn in section 1K". A following curvature can be two-dimensional or three-dimensional trained, according to the curved section 17d, which was described before. It flows over a transition section in a linear piece of 17e, because of whose front end the drinking section of the stem 17a is.

Opening, which is symbolized in figure 4, but not at the time is done, at which the lower opening 10 is not yet locked, is a taking of the beverage via removing the cap to symbolize. Represented is in figure 4 at the here lower final section (when filling), when taking however the upper final section, putting on the cap 3 for the relocking. During the relocking imprinting drinking the 17a of the stem 17 takes place, to the Beabstanden of the stopper 19 from used 4. Screwing the cap 3 onto the thread 3a provides for a firm seat, close locking and storing potential energy (in form of a spring tension), whereby this energy can arbitrarily often again be developed and by removing the cap

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in each case one sets free, with which release the drinking from the beverage box is squeezed out.

The tension end of 17d can accept several organizations, by which two for example at the figures 3a, 3b and 4 were described. Zwischenformen are just as possible as deviations of the concrete geometrical form from the represented examples.

Likewise the guidance 4c can be modified after figure 1 b or figure 1 A, is it in radial direction or is it in axial direction. The training of the guidance 4c is concretely shown in the drinking opening 4a, which remains after using using ILS 4 into the building hatch 11.

Also the kappenförmige catch 3 can be changed in its diameter.

He can be arranged for example larger, than in the explained form of the figure 1 b or 1 A, in which he exhibits a smaller diameter in each case than the intermediate sector 1K of the beverage box.

If the beverage box is locked, the section specified last is transformed to an edge of crease F (for example a double crease catch), which is then also pressure tight trained. The pressure component developed in the box after locking is larger, than the external pressure, so that an additional mechanical stabilization arises, which secures against mechanical deformation of the cylindrical section 1K. If a mechanical stability is given, the drinking assistance in the filled condition with its lower

end or with their remaining sections cannot be changed also in their internal situation, it is, the catch 3 is opened, which leads to an axial upward motion of the drinking assistance.

Also in the not locked condition and in the condition not filled yet, in which the beverage doses with a provided stem leave the work of the dose manufacturer, is given, on the one hand a safety device or an adjustment of the stem at the again-lockable end 2 (by plant at the inside of the cap 3) and on the other hand by supporting and not slipping plant of the end of 17b close of the open end, by means of which the dose filling is to take place with the Abfüller.

The Abfüller fills the box in such a way, as she is delivered to it, without he must change its Abfülllinie over. It did not out-stand practically uninfluenced of it that the supplied beverage box already possesses an inserted drinking assistance, those axially and therefore those

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Filling not to obstruct can. The filling of the box does not happen in the normal procedure, like also usual beverage doses to be filled, a drinking assistance exhibit and no again-lockable opening in the domförmigen soil section 1a".

Nevertheless the drinking assistance has one already internal voltage given by the manufacturer of the gathering mold, which can be used and used by the user (after filling). The storage of the energy is caused by barriers of the again-lockable end, filling has on it no influence.

The adjustment of the stem at the other end can be improved thereby that more than only one plant place is made available, for example a pitch circle, which rests against the drawn in upper end, as evident from figure 4. The pitch circle has a larger diameter, than the opening 10 with its diameter those, in order to avoid a slipping out of the energized stem 17 with its tension end.

It understands itself that with application one inserted 4 into the technical opening 11 a connection technique is used, which is close against pressure and liquid as for example sticking, seals or a sealant or gaskets, which is used. A snatching bolting device is also possible with additional under pressure standing seal, for sealing against positive pressure.

A direct injection moulding is likewise possible into the opening 11. The Anformung can take place from axial outside or from axial inside.

For the setting up the tension section 17d or 17d' kann the stem 17 around 10% to 50% longer its, than axial extending of the beverage box. If a spiral or a partial spiral is intended as " at least in sections spiral " organization, then the number of revolutions can (in (p-direction) between 0,5 and 3 to be selected. In exceptional cases a coil extent of up to five revolutions can be selected. The upward gradient of the stem within this range is then relatively flat, becomes however more steeply the linear section 17e.

The spiral organization does not have to be compellingly symmetrical, therefore axial extending of the 360 - coiling a respective spiral section resemble to possess. It can be for example favourable to select within the range of the eingehalsten section 1K " the distance very small, if necessary zero. A so formed circle cannot do any more from the filler opening 10 under tension does not out-step, because it is held by the Neck 1K " in the box in their internal I.

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During the use of the filled up beverage box, with which the opening 10 described last is locked, no element is pressed when opening the inside the box. A possible letting of the stopper 19 go away can ensure that a user continues to pull out the stem 17 with the mouth, when the internal mechanical stress of the tension section would move him outward.

The sections of the drinking assistance described before are to be still supplemented. The drinking assistance 17 has the described tension section with that supporting 17b and has the described Austrittsabschnitt 17e with that drinking 17a. Between them is a bend section 17d, which applies the pre-loading. This section can exhibit be preformed, can bellows or be in form of a at least partly extensively running spiral 17d'gestaltet (in z-direction and (p-direction of the cylindrical coordinates orients).

Dependent on the concrete organization of the tension section 17d or 17d' nach figure 4, the plant place of the free end of 17b lies and/or. 17b' in a more or less small distance g or h from the edge of crease of the dose trunk not locked yet.

The three influence parameters mentioned are co-ordinated so with the fact that the purpose described before is reached. The angle is selected suitably, the plant place in the distance g, h from the edge of crease 1k\* is in such a way selected that the plant place close of the edge of crease lies, and the concrete spatial organization of the tension end of 17d of the drinking assistance 17 is likewise co-ordinated with it.

To redundantly mention the internal channel is 17c of the drinking assistance, who from the figures easily results. It hands end between a 17b and a drinking 17a and is continuous.

The stopper 19, which is arranged in the distance b from drinking the 17a of the stem 17, is non-relocatable arranged at the drinking assistance, close of the beginning of the tension section and still in course degree line towards section 17e.

The firm arrangement can be solved in a further example by influence of mechanical forces, if pulling of the stem 17 out after use and emptying are desired for purposes of the separate disposal. Pulling on the linear guidance section 17e, strong over the masses, leads to cutting or separating the stopper 19, which can be out-arranged as ring, and permits that

<Desc/Clms PAGE NUMBER 17>

Pull out the entire stem 17, also its tension end by the only remaining opening with removed cap 3. Without such cutting and pulling of the stem out provided with higher forces affecting of the linear section 17e is not necessary for withdrawing the stem, on the contrary this movement is automatically fulfilled by the internal tension, but limited by the described stopper 19, which fastens 4 or 4c in such a way at the guidance that those Driving out movement is stopped.

From it result mass for the guidance 4c in radial direction and the stopper 19 in radial direction, which fulfill this function, for example as described a circular stopper at the stem section 17e and a guidance, the one radial Measure exhibits, which is smaller, as radial extending of the ring 19 at the stem.

Not represented however with words explainably a safety device against positive pressure is when opening the cover cap

3, which is intended as a vertical groove or an interruption distributed several times at the extent in the thread. Thereby when opening the positive pressure, which is developed in the box for mechanical stabilization with a karboniserten beverage, is aired out initially, if the seal seat of the Cap reason of the sealing disk 3b one solves. A way shooting of the Cover when opening can be avoided in such a way. If the thread or that Bayonet the last upward gradient briefly before removing reached, is already practically pressure-free it.

Also not represented, but easily explainably in figure 1 A is a safety device between the removable (turn offable) cap part of 3 and the remainder used 4 against opening or evenly an announcement, those by break of a seal or separating of the one

Barrier indicates that the cap was already once opened and the catch is not 2 thus no more in its original state.

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Requirements: 1. Thin-walled dose body ("box") for the admission of liquid contents, with a first final section (1 A, 1 a', 1 A'), an essentially cylindrical

Intermediate sector (1K) and a second final section (1 b), which second

Final section in relation to the first final section lies, whereby that

Intermediate sector (1K) the two final sections connects and one

Interior (I) of the thin-walled box defines, and whereby - in the second final section (1b) a circulating edge of crease (1k\*) arranged and so trained is to form with an edge of catch (1 b') of a cap (1 b') a crease (F) and with an essentially flat

Mirror (1 b') the cap without a openable opening that

To lock intermediate sector in the second final section (1 b) on one side; - in the first final section (1a) an opening (4a) is intended, which is openable locked over a plug (3) closely, but, whereby the opening is essentially centrally arranged in a section curved for the interior (I) of the box (1a') of the first final section (1a).

2. Thin-walled dose body after first of the previous requirements, whereby the openable opening (4a) of one use-begin (4) is formed, which is inserted into a larger opening (11, 1 a\*) in the first final section (1 A) and sealing, in order (i) to the interior (I) the radial guidance, (ii) to the outside space a connecting zone (3a) to open and latches of the openable opening to make available.

3. Thin-walled box according to requirement 2 of the previous requirements, whereby that

Began (4) is essentially from plastic trained.

4. Thin-walled box after one of the previous requirements, whereby the box in the locked condition before first opening - due to an internal pressure against mechanical deformations is pressure resistant; - the drinking assistance (17) in the interior is essentially situation stable, in order not to be changeable in her situation in the interior (I) of the box from the outside.

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5. Filled beverage box with a beverage (G) in an interior (I) and a by hand not a openingable cover (1 b') on a crease side (F, 1 b) that

Beverage box as well as a again-lockable opening section (4,3) in a opposite section (1 A) of the beverage box, which opening section exhibits (i) a plastic exhibiting thread segment (3a); (II) on the thread segment led, against pressure a sealing

Catch (3).

6. Beverage box according to requirement 5, with a drinking assistance (17), lain in the interior, to the out moving of a section of it when opening the catch and for taking the beverage over or by the drinking assistance (17).

7. Beverage box according to requirement 6, whereby the axial movement drinking assistance at the catch in locked position is closed, in relation to that opening, which was used for filling the beverage box.

8. Began (4) for a thin-walled dose body after one the previous

Requirements, whereby with a catch locked however a openable opening (4a) in use-begin (4) is formed, which began into an opening (11, 1 a\*) in the first final section (1 A) over a collar (4d) from axial inside (I) firmly and sealing insertable is, around (i) to the outside space a connecting zone (3a) to open and latches openable the opening (4a); (ii) to the interior (I) an opening (4c) to the withdrawal of contents of the Dose body; to make available.

9. Began according to requirement 8 of the previous requirements, whereby use-begin (4) is essentially from plastic trained.

10. Thin-walled container body ("container") after one of the previous requirements, whereby the opening with a plug (3), locked first, is again-lockably locked, in particular over a thread system (3a).

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11. Container after one of the previous requirements, whereby a guidance (4c) for one Drinking assistance in the opening locked first (4a, 1a\*) is convenient, in particular the opening (4a) from axial is outside released, as by in

Unscrew a kappenförmigen catch (3,3a).

12. Container according to requirement 11 of the previous requirements, whereby the kappenförmige Plug (3) a diameter exhibits, which is smaller than in

Diameter of the intermediate sector (1K), in particular under 2 cm lies.

13. Container after one of the previous requirements, whereby a drinking assistance (17) as Trinkhalm is implemented.

14. Container after one of the previous requirements, whereby a drinking assistance (17) at least in sections spiral (17b')

top in the interior of the box in the locked Condition is taken up.

15. Container after one of the previous requirements, whereby a drinking assistance (17) exhibits first and a second final section (17a, 17b), which in each case End a continuous channel (17c), limited by the drinking assistance, form.

16. Container after one of the previous requirements, whereby the opening (4a, 1a\*) one Guidance (4c) exhibits, which exhibits an internal measure (4a), which - enough is large to through-supply a longitudinal section (17e) that drinking assistance (17); - enough is small, substantial radial avoiding of the section that To close drinking assistance from the opening (4a), - air between an edge of the opening (4a) and the drinking assistance (17) to happen leaves, in order to lead the drinking assistance close of the opening.

17. Container after one of the previous requirements, whereby one of second Final section (1 b) furthest place of the catch (3) only such a first axial distance (f) exhibits that the catch (3) one that first Final section of the container correspond-cut off a stacked Container does not affect and a second distance of it holds (e+d; C).

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18. Container according to requirement 17 of the previous requirements, whereby a Bodenring (1a') of the Container only such a axially which is away measure exhibits, in order to hold in the same stacked condition of two doses a third distance (E) from the appropriate final section of the stacked container.

19. Container according to requirement 17 of the previous requirements, whereby the catch does not out-stand over one level, in the one rebellion ring (1a') first Final section is convenient.

20. Container after one of the previous requirements, whereby a again-lockable Catch (2; 3,4, 4a) in a domförmigen zone (1a ") first Final section (1a) arranged is, in particular in a deepest place essentially in the center of the first final section.

21. Container after one of the previous requirements, whereby it is educated as a thin-walled box from a Metallblech, to filling with a liquid beverage (G) by the still open second final section (10,1b).

22. Container according to requirement 16 of the previous requirements, whereby the guidance in first Final section (1a) is arranged.